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## Engineering Technology Program in Malaysia: A Market Survey

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### Abstract

In line with industrial development which is growing rapidly in Malaysia, engineering technology program is likely to be introduced in Malaysia education system at higher level. Towards developing the electrical engineering technology program and designing a curriculum structure in Universiti Teknikal Malaysia Melaka (UTeM), a market survey has been conducted to gather opinion from industries on the relevant subjects, duration of training required and also the career opportunity. The market research survey was conducted by the Committee of Development for Engineering Technology, UTeM in 2011. A total of 110 questionnaires were distributed to local and foreign companies throughout Malaysia. The scope of the market survey covered the common understanding of the concept of Engineering Technologist, requirements from industry perspective, the relevant focus areas as well as perceptions towards the program. As a result, the market research shows that there is a demand for degree programs in Electrical Engineering Technology.

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*Keywords:* Engineering Technology; Engineering Technologists; Technologist

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### 1. Introduction

Engineering technology and engineering have become the essential goal for many countries where there are great needs of competent technical workforce. There is an interface between engineering technology and engineering people in workplace whereby technologists focus more on application and implementation while engineers focus more on research and development [1]. Preparation to provide technical workforce in engineering technology starts from the educational stage especially at higher learning institutions. Many higher learning institutions have developed engineering technology program curriculum. Several studies regarding the technology program were done and reported [1], [2] and [3]. Engineering technology program that is able to provide competent and high-skilled workforce has become crucial and more demanding from industrial. Not only

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for undergraduate program, there is a study report that suggests master program in engineering management specifically targeted at graduates of an engineering technology program [4].

A part of engineering technology, the electrical engineering technology program has been developed for the purpose of preparing workforce who is able to operate facilities in the field of power engineering industry especially in electric power generation industry, renewable power generation, transmission, distribution of power, the utilities, maintenance, electrical installations and electrical power system design. The approaches of the teaching methods and current curricula for electrical were studied to provide educators the unclear topics and concept about electricity to the future electrical technologist [5] and [8].

## **2. The Program Survey Approach**

The Malaysian Government in Ninth Malaysia Plan (9MP) 2006-2010 and Tenth Malaysia Plan (10MP) 2011-2015 has emphasized human capital development as the focus in the face of global competition [6]. According to the study for the Third Malaysia Outline Perspective Plan (OPP3) 2001-2010, generally the number of technical workforces needed by the country between 2000 and 2010 amounted to 468,983 engineers and assistant engineers in various fields of engineering including electrical and electronic engineering in the country. Electrical and electronic field requires almost 46,000 engineers and 136,000 assistant engineers [7].

In line with industrial development in Malaysia which is growing rapidly, the country essentially is in need of competent technical personnel that have the ability to apply the concept of technology, improve equipment and system utilization, optimum operation and maintenance of equipments, plant systems and structures to align with workforce in developed countries.

Accordingly, a sophisticated system in the industries require highly skilled and competent person to supervise the installation tests, operations, maintenance links and also management. In addition, the industries also require skilled workers, who have strong knowledge that are able to innovate, modify and operate most of the processes and facilities in the field of power engineering. Moreover, service sector area also requires electric power engineering technology graduates in order to serve the electric power generation industry, renewable power generation, transmission, distribution of power, the utilities, maintenance and electrical installations, and electrical power system design.

Therefore, professional and skilled workforce that will be produced in the field of Electrical Engineering Technology (Power Industry) as in mentioned sectors are in great demand. Although, the engineers currently produced by the local public university (IPTA) in this field are also able to design and analyze, but they are still lack of practical and technical skills to operate, supervise, maintain, modify and innovate the industry related work [8]. Thus, UTeM plays an important role to complement the industry needs by producing engineering technologists who have technical knowledge and great practical skills.

## **3. The Market Survey**

A market survey was conducted by the UTeM in 2011 with a total of 110 questionnaires distributed to local companies and foreign companies in Malaysia. From 110 questionnaires distributed, 46 forms had been returned comprising 42% of the total forms distributed. The market survey has covered the local and international companies in Malaysia. Based on the forms received, 87% of the respondents are from local company while 13% of the respondents are from international companies.

The scope of the market survey includes general understanding of the concept of Engineering Technologists in industries, graduate in industry perspective, the focus areas and the perception of the program. Questionnaire also included the career opportunities for this program.

#### 4. Data Analysis

Based on the analyzed data, it shows that there is a great demand for degree programs in Electrical Engineering Technology by the industries. From the survey, 75% of the respondents are able to offer between 1 to 5 positions in their organization, 9% of the respondents are able to provide 6 to 10 positions in their organization, 7% of the respondents state the organization is able to provide 11 to 15 positions and 9% of the respondents agree to offer the position with condition depending on the current vacancy. It shows that there is a high percentage of demand for workforce in Electrical Engineering Technology. Figure 1 shows the number of positions offered by the industry to graduates in Electrical Engineering Technology.

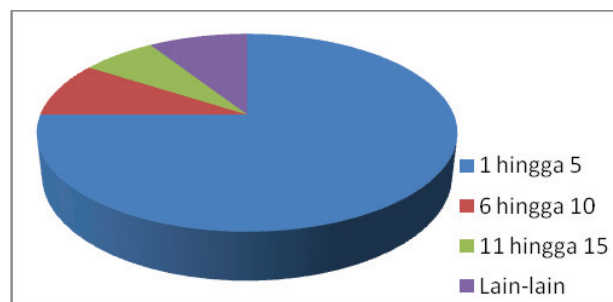


Fig. 1. The number of positions offered by the industry to graduate programs in Electrical Engineering Technology in an organization

The market research from UTeM also shows that for starting salary range for Engineering Technologist, 62% of employers agree from RM 1,501 - RM 2,000, 33% agree for more than RM 2,000, 2% agree in the range of RM 1,001 - RM 1,500 while only 2% of employers thought of starting salary of less than RM 1,000. Figure 2 shows the summary of the monthly salary for Engineering Technologist graduate from Electrical Engineering Technology Program.

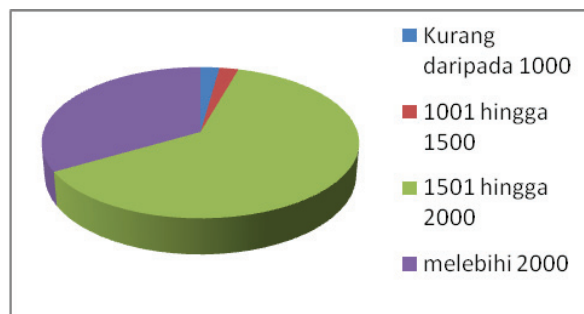


Fig. 2. Monthly salary for Engineering Technologist graduate in Electrical Engineering Technology Program in Malaysian Ringgit

The following diagrams show the job placement for Engineering Technology graduate in the area of engineering according to the perception of the industry. The highest demand (47%) for Engineering Technologist comes from the service, maintenance and consulting sector followed by manufacturing sector (33%).



Fig. 3. Engineering Technologist job placement for relevant area

Figure 4 shows the demand for Engineering Technologist by areas. The top two areas with high demand are maintenance (20%), followed by the manufacturing area (18%).

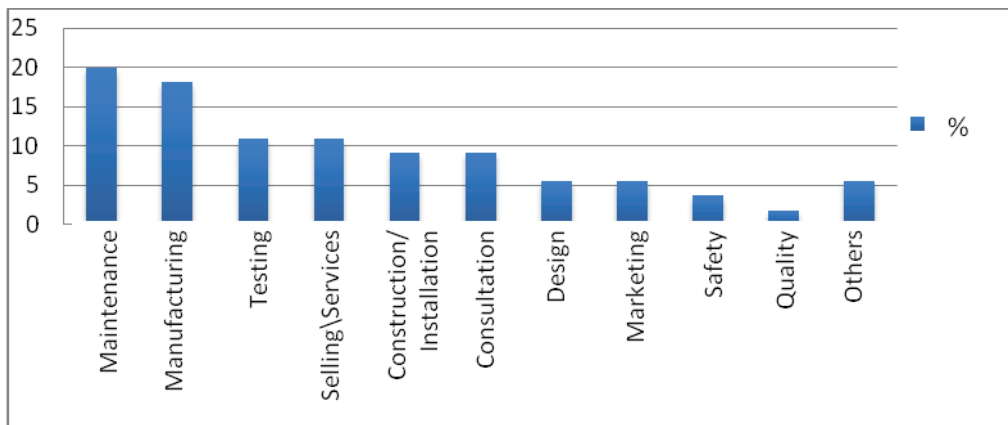


Fig. 4. The need of Engineering Technologist by area

Most of the respondents suggested that the Engineering Technologist is most suitable in the maintenance division in their organizations. It is then followed by the areas like production or manufacturing, testing, marketing and service, construction or installation and others. It shows that the industries or area which requires a highly practical and technically skilled workforce requires Engineering Technologist the most.

Figure 5 shows the feedback from industries on whether the program criteria meet the latest industrial requirements. The criteria set are market suitability, equipment, ICT utilization, law, the latest concepts and

theories. Findings from the survey concluded that the program offered has 100% fully or partly meets the need of market and industrial requirements. However, some of the respondents did not agree that the program needs high level of legal criteria.

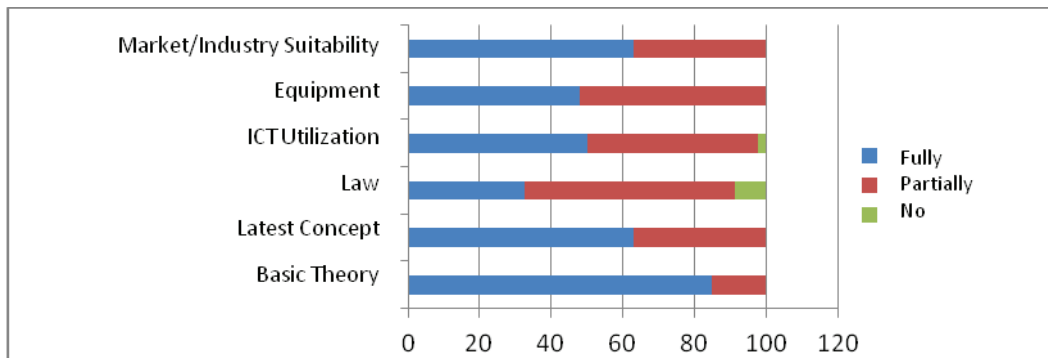


Fig. 5. The criteria of programs offered

Figure 6 shows the respondents feedback on the curriculum to be offered for the Bachelor of Electrical Engineering Technology program in UTeM. It shows 98% of the respondents agreed that the curriculum offered is of the latest theoretical concepts. Likewise, 98% indicated that the subjects offered give strength to the proposed program. 96% agreed that the subjects offered suits the program. Similarly, 96% agreed with the program. 83% indicated that the programs offered cover the whole subject. As for the industrial training period, 100% of the respondents agreed that the sufficient industrial attachment is 6 months. As a result, most of the respondents give a positive remark for the Engineering Technology program.

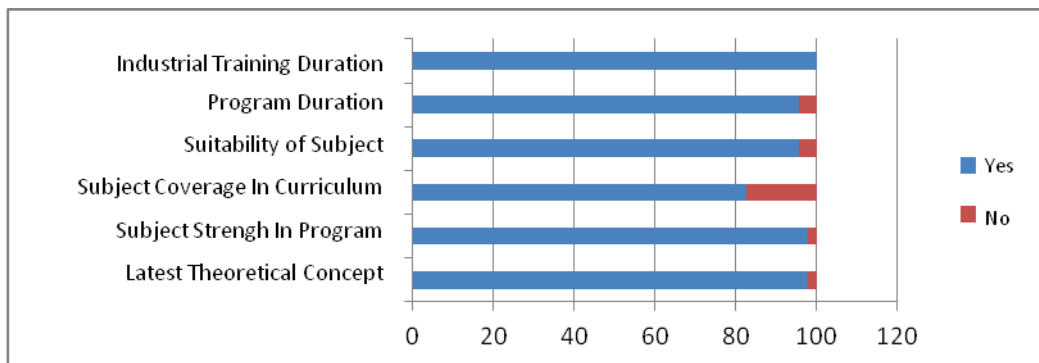


Fig. 6. Implementation of the program and subject

## 5. Conclusion

In conclusion, the findings of market research survey show that there is an urgent need for Engineering Technologist in Malaysia. Most respondents agreed that the Bachelor of Electrical Engineering Technology program will be able to produce graduates with high practical and technical skills. The Engineering Technologist

produced will also fit the requirements and fulfil the demand in the job market. The findings also suggest that Engineering Technologist is most suitable in maintenance area, followed by the production and manufacturing, testing, marketing and service, construction or installation and others. Market research findings also show that 96% of the respondents agreed that the curriculum of program offered by UTeM can produce graduates which are in line with increasing industrial needs nowadays.

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